

OIPE

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/656,309

DATE: 04/16/2001
TIME: 11:25:44

Input Set : A:\es.txt
Output Set: N:\CRF3\04162001\I656309.raw

ENTERED

3 <110> APPLICANT: DIVERSA CORPORATION
4 CALLEN, Walter
5 MATHUR, Eric
7 <120> TITLE OF INVENTION: ENZYMES HAVING HIGH TEMPERATURE POLYMERASE ACTIVITY AND
METHODS OF USE
8 THEREOF
10 <130> FILE REFERENCE: DIVER1350-2
12 <140> CURRENT APPLICATION NUMBER: US 09/656,309
13 <141> CURRENT FILING DATE: 2000-09-06
15 <160> NUMBER OF SEQ ID NOS: 2
17 <170> SOFTWARE: PatentIn version 3.0
19 <210> SEQ ID NO: 1
20 <211> LENGTH: 2412
21 <212> TYPE: DNA
22 <213> ORGANISM: Pyrolobus fumarius
24 <220> FEATURE:
25 <221> NAME/KEY: CDS
26 <222> LOCATION: (1)..(2412)
28 <400> SEQUENCE: 1
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30 Met Thr Glu Val Val Phe Thr Val Leu Asp Ser Ser Tyr Glu Val Val
31 1 5 10 15
33 ggt aaa gag cct cag gta atc ata tgg ggt att gct gag aac ggc gag 96
34 Gly Lys Glu Pro Gln Val Ile Ile Trp Gly Ile Ala Glu Asn Gly Glu
35 20 25 30
37 agg gta gtc ctc att gac agg tct ttt cgc cca tac ttc tat gcg ctg 144
38 Arg Val Val Leu Ile Asp Arg Ser Phe Arg Pro Tyr Phe Tyr Ala Leu
39 35 40 45
41 ctt gca ccg ggc gcc gat cct aag cag gta gca caa cgt att cgt gca 192
42 Leu Ala Pro Gly Ala Asp Pro Lys Gln Val Ala Gln Arg Ile Arg Ala
43 50 55 60
45 ttg agt agg cca aag agc ccg att ata ggt gta gag gat gac aag agg 240
46 Leu Ser Arg Pro Lys Ser Pro Ile Ile Gly Val Glu Asp Asp Lys Arg
47 65 70 75 80
49 aag tac ttc ggg agg cct cgt agg gtc tta cgt att cgc acc gtg cta 288
50 Lys Tyr Phe Gly Arg Pro Arg Arg Val Leu Arg Ile Arg Thr Val Leu
51 85 90 95
53 ccc gag gct gtt agg gag tat cgc gaa ctc gta aag aac gtt gat ggt 336
54 Pro Glu Ala Val Arg Glu Tyr Arg Glu Leu Val Lys Asn Val Asp Gly
55 100 105 110
57 gtt gag gat gtt cta gag gcg gat ata cgc ttc gct atg cgc tat ctc 384
58 Val Glu Asp Val Leu Glu Ala Asp Ile Arg Phe Ala Met Arg Tyr Leu
59 115 120 125
61 ata gat cac gat cta ttt cct ttc acc tgg tac cgt gta gag gct gag 432
62 Ile Asp His Asp Leu Phe Pro Phe Thr Trp Tyr Arg Val Glu Ala Glu
63 130 135 140
65 ccc ctc gag aac aag atg ggc ttc cgt gtc gac aag gta tac ctg gtt 480
66 Pro Leu Glu Asn Lys Met Gly Phe Arg Val Asp Lys Val Tyr Leu Val

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67	145	150	155	160																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
69	aag	agc	agg	ccg	gag	cca	ctt	tat	ggt	gag	gct	ctc	gca	cca	acc	aag	528																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
70	Lys	Ser	Arg	Pro	Glu	Pro	Leu	Tyr	Gly	Glu	Ala	Leu	Ala	Pro	Thr	Lys																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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73	ctt	ccc	gat	ctt	agg	ata	ctc	gag	ttc	gat	att	gaa	gtt	tat	agc	aag	576																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
74	Leu	Pro	Asp	Leu	Arg	Ile	Leu	Ala	Phe	Asp	Ile	Glu	Val	Tyr	Ser	Lys																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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77	caa	ggg	tcg	ccg	cgt	cca	gag	cgc	gat	cct	gta	ata	gtg	ata	gct	gtg	624																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
78	Gln	Gly	Ser	Pro	Arg	Pro	Glu	Arg	Asp	Pro	Val	Ile	Val	Ile	Ala	Val																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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81	aag	act	gac	gat	ggc	gat	gag	gtg	cta	ttc	att	gca	gag	ggc	aaa	gac	672																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
82	Lys	Thr	Asp	Asp	Gly	Asp	Glu	Val	Leu	Phe	Ile	Ala	Glu	Gly	Lys	Asp																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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85	gat	cga	aaa	ccg	ata	cgc	gag	ttt	gta	gag	tac	gtg	aag	agg	tat	gac	720																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
86	Asp	Arg	Lys	Pro	Ile	Arg	Glu	Phe	Val	Glu	Tyr	Val	Lys	Arg	Tyr	Asp																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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89	ccc	gac	ata	ata	gtc	ggt	tat	aac	aac	aat	cat	ttc	gat	tgg	cct	tat	768																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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104	Glu	Ile	Lys	Ile	Lys	Ser	Leu	Glu	Glu	Val	Ala	Glu	Tyr	Leu	Gly	Val																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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107	Met	Lys	Lys	Ser	Glu	Arg	Val	Ile	Ile	Asn	Trp	Trp	Glu	Ile	Pro	Asp																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	8010	8011	8012	8013	8014	8015	8016	8017	8018	8019	8020	8021	8022	8023	8024	8025	8026	8027	8028	8029	8030	8031	8032	8033	8034	8035	8036	8037	8038	8039	8040	8041	8042	8043	8044	8045	8046	8047	8048	8049	8050	8051	8052	8053	8054	8055	8056	8057	8058	8059	8060	8061	8062	8063	8064	8065	8066	8067	8068	8069	8070	8071	8072	8073	8074	8075	8076	8077	8078	8079	8080	8081	8082	8083	8084	8085	8086	8087	8088	8089	8090	8091	8092	8093	8094	8095	8096	8097	8098	8099	80100	80101	80102	80103	80104	80105	80106	80107	80108	80109	80110	80111	80112	80113	80114	80115	80116	80117	80118	80119	80120	80121	80122	80123	80124	80125	80126	80127	80128	80129	80130	80131	80132	80133	80134	80135	80136	8013

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/656,309

DATE: 04/16/2001
TIME: 11:25:44

Input Set : A:\es.txt
Output Set: N:\CRF3\04162001\I656309.raw

133	act tac cgt ggc gct ata gtt ctt gag ccg ttg aga ggc gtg cac gag	1296
134	Thr Tyr Arg Gly Ala Ile Val Leu Glu Pro Leu Arg Gly Val His Glu	
135	420 425 430	
137	aat ata gcc gta ctc gac ttt agc tcg atg tac cca aac atc atg ata	1344
138	Asn Ile Ala Val Leu Asp Phe Ser Ser Met Tyr Pro Asn Ile Met Ile	
139	435 440 445	
141	aag tac aat gtt ggt cct gac acg ctt gtg agg cct ggt gaa aag tgt	1392
142	Lys Tyr Asn Val Gly Pro Asp Thr Leu Val Arg Pro Gly Glu Lys Cys	
143	450 455 460	
145	ggc gag tgt ggt tgc tgg gag gcc ccg gag gtc aag cac agg ttc cgt	1440
146	Gly Glu Cys Gly Cys Trp Glu Ala Pro Glu Val Lys His Arg Phe Arg	
147	465 470 475 480	
149	agg tgt ccg ccc ggc ttc ttc aag aca gtt ctt gag agg ctg tta gag	1488
150	Arg Cys Pro Pro Gly Phe Phe Lys Thr Val Leu Glu Arg Leu Leu Glu	
151	485 490 495	
153	ctt cgt aag cgt gtg cgt gct gaa atg aag aag tat cct ccg gat agc	1536
154	Leu Arg Lys Arg Val Arg Ala Glu Met Lys Lys Tyr Pro Pro Asp Ser	
155	500 505 510	
157	cca gaa tat cga ctg ttg gat gaa agg cag aag gcg ttg aag gtt ctt	1584
158	Pro Glu Tyr Arg Leu Leu Asp Glu Arg Gln Lys Ala Leu Lys Val Leu	
159	515 520 525	
161	gca aac gct agt tac ggc tac atg ggt tgg agc ggc gct agg tgg tat	1632
162	Ala Asn Ala Ser Tyr Gly Tyr Met Gly Trp Ser Gly Ala Arg Trp Tyr	
163	530 535 540	
165	tgc agg gag tgc gca aag gct gtc acg gct tgg ggt agg cac ctc ata	1680
166	Cys Arg Glu Cys Ala Lys Ala Val Thr Ala Trp Gly Arg His Leu Ile	
167	545 550 555 560	
169	cgc acc gcc atc aac ata gct cgt aaa cta ggc ctc aag gtg atc tac	1728
170	Arg Thr Ala Ile Asn Ile Ala Arg Lys Leu Gly Leu Lys Val Ile Tyr	
171	565 570 575	
173	ggt gac aca gat tcg ctc ttc gtg acc tat gat ccg gag aag gtg gaa	1776
174	Gly Asp Thr Asp Ser Leu Phe Val Thr Tyr Asp Pro Glu Lys Val Glu	
175	580 585 590	
177	aat ttc atc aaa att ata aag gag gag ctg ggg ttc gaa atc aag cta	1824
178	Asn Phe Ile Lys Ile Ile Lys Glu Glu Leu Gly Phe Glu Ile Lys Leu	
179	595 600 605	
181	gag aag gtg tac aaa cgc tta ttc ttt aca gag gct aag aag agg tac	1872
182	Glu Lys Val Tyr Lys Arg Leu Phe Phe Thr Glu Ala Lys Lys Arg Tyr	
183	610 615 620	
185	gct ggc ctt ctc gag gac gga cgt ata gat att gtc ggt ttc gag gct	1920
186	Ala Gly Leu Leu Glu Asp Gly Arg Ile Asp Ile Val Gly Phe Glu Ala	
187	625 630 635 640	
189	gta cgt ggc gat tgg tgt gaa ctc gcc aag gag gtt cag act aag gtt	1968
190	Val Arg Gly Asp Trp Cys Glu Leu Ala Lys Glu Val Gln Thr Lys Val	
191	645 650 655	
193	gtc gaa ata gta ttg aag acg agt gag gtg aac aag gct gta gag tac	2016
194	Val Glu Ile Val Leu Lys Thr Ser Glu Val Asn Lys Ala Val Glu Tyr	
195	660 665 670	
197	gtc agg aag att gtg aaa gag ttg gag gag ggc aag gtt ccc ata gag	2064

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PATENT APPLICATION: US/09/656,309

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Input Set : A:\es.txt
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198 Val Arg Lys Ile Val Lys Glu Leu Glu Gly Lys Val Pro Ile Glu			
199 675 680 685			
201 aag ctt gta atc tgg aag acc ctt agt aag cgt ctt gag gag tac aca	2112		
202 Lys Leu Val Ile Trp Lys Thr Leu Ser Lys Arg Leu Glu Glu Tyr Thr			
203 690 695 700			
205 acg gag gca cca cac gtc gtt gca gcg aag agg atg ctg tca gca ggc	2160		
206 Thr Glu Ala Pro His Val Val Ala Lys Arg Met Leu Ser Ala Gly			
207 705 710 715 720			
209 tac cgg gta agc cca ggc gac aag ata ggg tat gta ata gtg aag ggt	2208		
210 Tyr Arg Val Ser Pro Gly Asp Lys Ile Gly Tyr Val Ile Val Lys Gly			
211 725 730 735			
213 ggt ggc cgt atc agt caa aga gca tgg cca tac ttc atg gtc aag gat	2256		
214 Gly Gly Arg Ile Ser Gln Arg Ala Trp Pro Tyr Phe Met Val Lys Asp			
215 740 745 750			
217 cct agc cag ata gac gtg acc tac tat gtt gac cac caa atc atc ccg	2304		
218 Pro Ser Gln Ile Asp Val Thr Tyr Val Asp His Gln Ile Ile Pro			
219 755 760 765			
221 gct gca ttg aga ata ctg ggc tac ttt ggc atc acc gag aag aag ctg	2352		
222 Ala Ala Leu Arg Ile Leu Gly Tyr Phe Gly Ile Thr Glu Lys Lys Leu			
223 770 775 780			
225 aaa gca agt gca act ggg cag aag act ctc ttc gac ttt cta gcc aag	2400		
226 Lys Ala Ser Ala Thr Gly Gln Lys Thr Leu Phe Asp Phe Leu Ala Lys			
227 785 790 795 800			
229 aag agc aag taa	2412		
230 Lys Ser Lys			
234 <210> SEQ ID NO: 2			
235 <211> LENGTH: 803			
236 <212> TYPE: PRT			
237 <213> ORGANISM: Pyrolobus fumarius			
239 <400> SEQUENCE: 2			
241 Met Thr Glu Val Val Phe Thr Val Leu Asp Ser Ser Tyr Glu Val Val			
242 1 5 10 15			
245 Gly Lys Glu Pro Gln Val Ile Ile Trp Gly Ile Ala Glu Asn Gly Glu			
246 20 25 30			
249 Arg Val Val Leu Ile Asp Arg Ser Phe Arg Pro Tyr Phe Tyr Ala Leu			
250 35 40 45			
253 Leu Ala Pro Gly Ala Asp Pro Lys Gln Val Ala Gln Arg Ile Arg Ala			
254 50 55 60			
257 Leu Ser Arg Pro Lys Ser Pro Ile Ile Gly Val Glu Asp Asp Lys Arg			
258 65 70 75 80			
261 Lys Tyr Phe Gly Arg Pro Arg Arg Val Leu Arg Ile Arg Thr Val Leu			
262 85 90 95			
265 Pro Glu Ala Val Arg Glu Tyr Arg Glu Leu Val Lys Asn Val Asp Gly			
266 100 105 110			
269 Val Glu Asp Val Leu Glu Ala Asp Ile Arg Phe Ala Met Arg Tyr Leu			
270 115 120 125			
273 Ile Asp His Asp Leu Phe Pro Phe Thr Trp Tyr Arg Val Glu Ala Glu			
274 130 135 140			
277 Pro Leu Glu Asn Lys Met Gly Phe Arg Val Asp Lys Val Tyr Leu Val			

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/656,309

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Input Set : A:\es.txt
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278	145	150	155	160
281	Lys Ser Arg Pro Glu Pro Leu Tyr Gly Glu Ala Leu Ala Pro Thr Lys			
282	165	170	175	
285	Leu Pro Asp Leu Arg Ile Leu Ala Phe Asp Ile Glu Val Tyr Ser Lys			
286	180	185	190	
289	Gln Gly Ser Pro Arg Pro Glu Arg Asp Pro Val Ile Val Ile Ala Val			
290	195	200	205	
293	Lys Thr Asp Asp Gly Asp Glu Val Leu Phe Ile Ala Glu Gly Lys Asp			
294	210	215	220	
297	Asp Arg Lys Pro Ile Arg Glu Phe Val Glu Tyr Val Lys Arg Tyr Asp			
298	225	230	235	240
301	Pro Asp Ile Ile Val Gly Tyr Asn Asn Asn His Phe Asp Trp Pro Tyr			
302	245	250	255	
305	Leu Leu Arg Arg Ala Arg Ile Leu Gly Ile Lys Leu Asp Val Thr Arg			
306	260	265	270	
309	Arg Val Gly Ala Glu Pro Thr Thr Ser Val His Gly His Val Ser Val			
310	275	280	285	
313	Pro Gly Arg Leu Asn Val Asp Leu Tyr Asp Tyr Ala Glu Glu Met Pro			
314	290	295	300	
317	Glu Ile Lys Ile Lys Ser Leu Glu Glu Val Ala Glu Tyr Leu Gly Val			
318	305	310	315	320
321	Met Lys Lys Ser Glu Arg Val Ile Ile Asn Trp Trp Glu Ile Pro Asp			
322	325	330	335	
325	Tyr Trp Asp Asp Pro Lys Lys Arg Pro Leu Leu Leu Gln Tyr Ala Arg			
326	340	345	350	
329	Asp Asp Val Arg Ala Thr Tyr Gly Leu Ala Glu Lys Ile Leu Pro Phe			
330	355	360	365	
333	Ala Ile Gln Leu Ser Tyr Val Thr Gly Leu Pro Leu Asp Gln Val Gly			
334	370	375	380	
337	Ala Met Ser Val Gly Phe Arg Leu Glu Trp Tyr Leu Ile Arg Ala Ala			
338	385	390	395	400
341	Phe Lys Met Lys Glu Leu Val Pro Asn Arg Val Glu Arg Pro Glu Glu			
342	405	410	415	
345	Thr Tyr Arg Gly Ala Ile Val Leu Glu Pro Leu Arg Gly Val His Glu			
346	420	425	430	
349	Asn Ile Ala Val Leu Asp Phe Ser Ser Met Tyr Pro Asn Ile Met Ile			
350	435	440	445	
353	Lys Tyr Asn Val Gly Pro Asp Thr Leu Val Arg Pro Gly Glu Lys Cys			
354	450	455	460	
357	Gly Glu Cys Gly Cys Trp Glu Ala Pro Glu Val Lys His Arg Phe Arg			
358	465	470	475	480
361	Arg Cys Pro Pro Gly Phe Phe Lys Thr Val Leu Glu Arg Leu Leu Glu			
362	485	490	495	
365	Leu Arg Lys Arg Val Arg Ala Glu Met Lys Lys Tyr Pro Pro Asp Ser			
366	500	505	510	
369	Pro Glu Tyr Arg Leu Leu Asp Glu Arg Gln Lys Ala Leu Lys Val Leu			
370	515	520	525	
373	Ala Asn Ala Ser Tyr Gly Tyr Met Gly Trp Ser Gly Ala Arg Trp Tyr			
374	530	535	540	

VERIFICATION SUMMARY
PATENT APPLICATION: US/09/656,309

DATE: 04/16/2001
TIME: 11:25:45

Input Set : A:\es.txt
Output Set: N:\CRF3\04162001\I656309.raw